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Parents' healthcare-seeking behavior for their children among the climate-related displaced population of rural Bangladesh

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ABSTRACT

In Bangladesh climate change has contributed to a massive displacement of people. This study examines the effects of climate-related displacement, socioeconomic status, availability of healthcare providers and disease-related attributes on the healthcare-seeking behaviors of parents for their children. Using cross-sectional survey data from the parents of 1003 children aged under 15 who were ill in the four weeks prior to the interview, collected from 600 randomly-selected households in climate displacement-susceptible areas and 600 households in non-climate-displacement-susceptible areas in Bangladesh, we use multivariate logistic regression to identify the factors associated with parental healthcare-seeking behaviors. The results show that 15.5% of the children who had been ill receive either no care or curative care at home. Of those receiving care outside the home, only 22.1% are treated by trained providers. Climate-related displaced parents are significantly less likely to seek care or to use provider-prescribed care to manage children's illnesses. Areas lacking local healthcare providers, poorer households, females, child age and mild illness are also associated with a child being significantly less likely to be treated outside the home. The children of climate-related displaced parents are around half as likely as those of non-displaced parents to be treated by a trained provider. The local availability of medical doctors, cost of reaching a healthcare center, household income, type and severity of illness, child's age, and joint parental decision-making about care providers are also important predictors of the selection of trained healthcare providers for children. Thus, climate-related displacement affects the healthcare-seeking behaviors of parents for their children. Policy aimed at improving child health should address the socioeconomic disadvantage and access to healthcare of the displaced, the training of local untrained providers about Primary Health Care service provision, and the numbers of medical doctors in the displacement-prone areas.

1. Introduction

Between 1990 and 2016, the under-five child mortality rate more than halved (from 93 to 41 deaths per 1000 live births) for the World and decreased by 76% (from 146 to 35 deaths per 1000 live births) in Bangladesh. The probability of dying for children aged 5–14 years decreased from 15 to 8 deaths per 1000 children aged 5 for the World and from 25 to 5 deaths per 1000 children aged 5–14years for Bangladesh (UNICEF et al., 2017). Yet, many more deaths in Bangladesh and other developing countries could be prevented by addressing socioeconomic inequalities, making the healthcare services available to all, and by more widespread use of appropriate care during illness (Amin et al., 2010; Elahi, 2016; Jones et al., 2003; UNICEF, 2016). The substantially lower utilization of modern maternal and child healthcare services provided by trained providers by poorer rural dwellers is a particular concern (Amin et al., 2010). This paper aims to investigate the healthcare-seeking behaviors of rural residents who have experienced permanent displacement related to floods and riverbank erosion in mainland Bangladesh. Riverbank erosion is a 'slow-onset' disaster which causes large scale permanent displacement, especially in this geographical context (Islam and Shamsuddoha, 2017).

Climate change affects health and exacerbates a range of challenges for healthcare management programs by exposing humans to more frequent and higher intensity extreme weather events (e.g., floods, droughts, sea level rise and land erosion) than would occur due to natural variability, and by disrupting ecosystems (e.g., agricultural production, freshwater flow, disease patterns), economies (e.g., income and livelihoods) and social systems (e.g., through forced migration and conflict) (Costello et al., 2009; McMichael and Lindgren, 2011; McMichael et al., 2006; McMichael et al., 2012; MoEF, 2009; Watts

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et al., 2015; Watts et al., 2018; Wu et al., 2016). Floods and changing river channels are linked with the higher magnitude of precipitation in major river basins, melting glaciers in the Himalayas, and a human-induced lowering of river gradients, and cause massive loss of land, to rivers, in many low-lying coastal and riverine areas in Bangladesh (Brouwer et al., 2007; IPCC, 2014; Oppenheimer et al., 2014; Pender, 2008). The anticipation or experience of such extreme events directly triggers migration and their legacies influence other determinants (e.g. socioeconomic) of migration, and thus also indirectly add to numbers of permanent migrants (Foresight, 2011; IPCC, 2014; McMichael et al., 2012; Schwerdtle et al., 2018). The effects of extreme weather events not only contribute to migration but also influence the proximate determinants of health of both those who actually have been displaced and those who potentially could experience climate-related displacement (Foresight, 2011; IPCC, 2014; Watts et al., 2015). There are both existing theoretical models which link climate change to migration and theoretical models which link migration (and other demographic variables) to and health-seeking behavior and health (Andersen, 1995; Schwerdtle et al., 2018). However, the complex multi-causality of health and migration makes it problematic to single out the precise effects of climate change, weather events, and climate-related displacement on health (Adger, 2010; McMichael et al., 2012; Schütte et al., 2018; Schwerdtle et al., 2018; Torres and Casey, 2017; Watts et al., 2018).

Studies in Bangladesh have found significant positive relationships between the incidence of leading infectious, waterborne and vector-borne disease causes of childhood morbidity and mortality (e.g., fever, diarrhea and acute respiratory infections) and increases in temperature, humidity, rainfall and the incidence of natural disasters (Hashizume et al., 2007; Hasib and Chathoth, 2016; Kabir et al., 2014; Mani and Wang, 2014; MoEF, 2009; Myint et al., 2011; NIPORT et al., 2016). In Bangladesh, an increasing frequency and severity of floods and riverbank erosion has been associated with a massive displacement of people and related restrictions of access to health facilities (Alam et al., 2017; Arsenault et al., 2015; Hutton and Haque, 2004; MoDMR, 2014).

Displacement which is related to weather events, either individually or cumulatively through riverbank erosion and changes to water channels, has been found to be associated with a higher incidence of illness, loss of household possessions, lower income and savings, reduced access to healthcare services and other basic necessities (e.g., food, water, sanitation, education and shelter), disruption of social networks and marginalization among the displaced (Abrar et al., 2004; Alam et al., 2017; Arsenault et al., 2015; Haque and Hossain, 1988; Hutton and Haque, 2004; Islam and Hasan, 2016; Islam and Shamsuddoha, 2017; McMichael et al., 2012; Rahman, 2009; Sarker et al., 2003; Schwerdtle et al., 2018; USAID, 2003; Wu et al., 2016). In the displacement-prone, low-lying riverine areas of Bangladesh following floods and changes to river channels the home and the homestead land are often completely destroyed and submerged in the relocated river channel, and returning to home is therefore often impossible (Arsenault et al., 2015; Haque and Hossain, 1988; Islam et al., 2010).

The local availability, affordability and accessibility of drugs and healthcare services are important determinants of healthcare-seeking behaviors (Caldwell et al., 2014; Huq and Tasnim, 2008; Obrist et al., 2007; Wahed and Mahmood, 2009). In Bangladesh, the healthcare options for children's treatment which are available to caregivers include; home-based curative care using local knowledge and understanding; self-care with traditional (e.g., herbal medicine, religious healing) and allopathic medicines; care from untrained providers (pharmacists, 'village doctors', traditional healers) involving traditional and allopathic medicines; and care from trained providers (medical doctors, nurses, midwives and community health workers) with allopathic medicines. Broadly speaking, healthcare services may be categorized into those provided by trained providers and those provided by untrained providers.

The availability of pharmacists and 'village doctors' is associated positively with higher levels of modern drug use and lower rates of using trained providers for child health in Bangladesh (Amin et al., 2010; Mahmood et al., 2009). As in other developing countries, seeking healthcare from qualified providers has been found to be more likely among those with higher incomes and education, and for severe illnesses (Amin et al., 2010; Das et al., 2013; Geldsetzer et al., 2014; Huq and Tasnim, 2008; Mats et al., 2017; Nasrin et al., 2013; Sreeramareddy et al., 2012).

The perceived type and severity of disease also affects parental acceptance of preventive care, delays in seeking care, and the choice of care providers (Alam et al., 2009; Das et al., 2013). Parental perceptions about healthcare-seeking behaviors have also been found to differ by the sex and age of the child (Geldsetzer et al., 2014; Pokhrel and Sauerborn, 2004). Boys are more likely to be treated by medical doctors than girls, and children aged 0–5 years are more likely to receive such treatment than those aged 6 and above (Alam et al., 2009; Das et al., 2013; Mahmood et al., 2009). Women's domestic autonomy and decision-making capacity have also been found to be positively associated with seeking healthcare from medical doctors both for children and for mothers (Alam et al., 2009; Amin et al., 2010; Das et al., 2013).

Cyclone survivors who moved to urban slum areas have been found to be living without clean water supplies and sanitation, education, and basic health services (Uddin and Mazur, 2015). Residents of heat-affected villages have been found to have experienced higher rates of illness over time but to have lower rates of using modern drugs when feeling sick (Haque et al., 2014). The previous studies conducted in Bangladesh on parents' utilization of healthcare services for their children's illnesses and sources of healthcare for their children's illnesses are mostly disease-specific and have not specifically considered the disaster-prone regions (Alam et al., 2009; Alamgir et al., 2010; Amin et al., 2010; Caldwell et al., 2014; Das et al., 2013; Huq and Tasnim, 2008; Nasrin et al., 2013). Moreover, none of the previous studies has specifically considered the effects of parents' displacement on their decision to seek healthcare for their children and to use trained providers for treatment. Moreover, comparisons of child healthcare-seeking behaviors between parents who have experienced displacement and parents who have not experienced displacement are absent from the literature. In view of the large and growing numbers affected by climate-related displacement, and the significant related challenges to rural child health and healthcare access, research on parental healthcare-seeking behaviors relating to their children among the climate displaced is critically important to informing the management of childhood diseases in Bangladesh and the development of appropriate health system responses to the adverse health outcomes of extreme weather events (Geldsetzer et al., 2014; Mani and Wang, 2014; Pender, 2008; Poncelet et al., 2010; Schütte et al., 2018; Schwerdtle et al., 2018; UNICEF, 2016; Watts et al., 2015). This paper aims to provide evidence to inform strategies for improving child healthcare in rural climate displacement-prone areas in mainland Bangladesh by investigating the extent to which seeking healthcare for a child's illness and the extent of use of trained, as opposed to untrained providers, differ between people who have experienced climate-related displacement permanently and those who have not been displaced. The definition of 'displacement' used in this paper excludes temporary movement which is followed by a return to the previous family homestead.

2. Methods

2.1. Conceptual framework

The conceptual framework (Fig. 1) for this study has been developed based on Andersen's behavioral model and its subsequent modifications (Andersen and Newman, 1973; Andersen et al., 2002; Andersen, 1995). According to this framework, the illness status and healthcare-seeking behaviors of populations are associated with

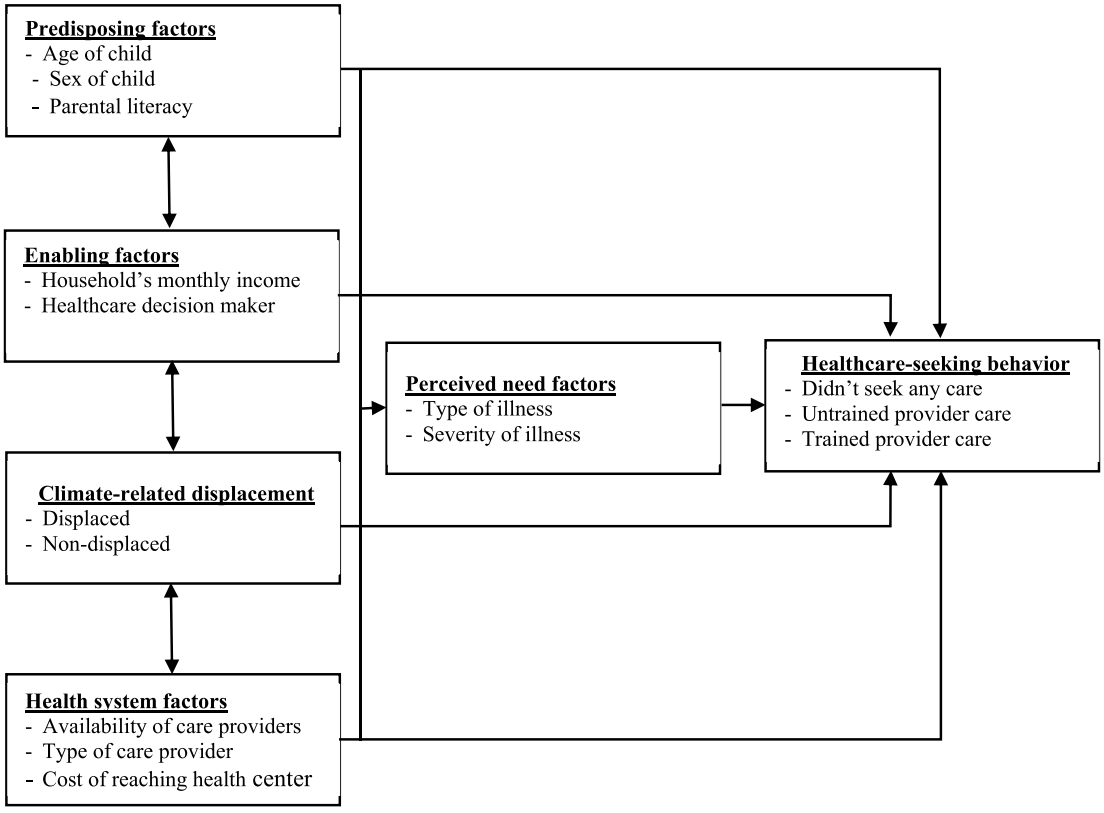

Fig. 1. Conceptual framework for explaining differences in the healthcare-seeking behaviors of displaced people and non-displaced people.

predisposing (demographic and social), enabling (households' income and decision making) and health system factors, as shown in Fig. 1. The model has been applied successfully to identify the effects of contextual and individual level characteristics on healthcare service utilization and to explain healthcare seeking behaviors, both in developed and developing countries (Amin et al., 2010; Babitsch et al., 2012; Chakraborty et al., 2003; Sreeramareddy et al., 2012).

Fig. 1 modifies Andersen's framework by incorporating climate-related displacement. Our modification suggests that displacement effects are associated with the predisposing, enabling and health system factors, and will influence healthcare-seeking behaviors both through effects on (perceived) illness-related need and through effects on some of the predisposing, enabling and health system factors. Displacement affects the health and wellbeing of the displaced in multiple ways. The displaced (those who have been forced to change their place of usual residence permanently as a result of weather/natural disaster-related events) are likely to have been socioeconomically impoverished and disadvantaged in terms of health and access to healthcare facilities prior to displacement, and to have become even more so post-displacement (Hutton and Haque, 2004; Poncelet et al., 2010; USAID, 2003). The health vulnerabilities of displaced people living in fragile environments are linked with their strategies for maintaining a livelihood and their limited access to cultivable land, freshwater, sanitation, and electricity (Alam et al., 2017; Hutton and Haque, 2004; USAID, 2003). Moreover, the combined effects of low socioeconomic status, inadequate access to wellbeing facilities, lack of modern transport facilities, recurrent loss of household assets and resettlement costs due to frequent natural disasters and displacement create a vicious cycle of poverty among the displaced and among those who live in the areas prone to natural disaster, and diminish their chances of living a healthy life (Alam et al., 2017; Hutton and Haque, 2003; Islam, 2007; Poncelet et al., 2010).

2.2. The study location

Bangladesh is widely recognized as one of the most climate-vulnerable countries in the World (Kreft et al., 2016; Poncelet et al., 2010). Almost 80% of the land lies on floodplains of rivers. In 2016 Bangladesh had an estimated total population of 161 million, and a population density of 1090 people per km^2 (BBS, 2017). With almost two-thirds living in the countryside, the population remains highly dependent on agriculture and natural resources (BBS, 2011). Of Bangladesh's 64 districts, 24 are classed as climate-displacement-prone (MoDMR, 2014). Half of these districts are located in the flood, riverbank erosion and displacement-prone mainland regions, where about 500,000 people annually experience displacement (Poncelet et al., 2010). 4.31 million people live in the two displacement-prone mainland districts studied, and 5.40 million in the two non-displacement-prone districts.

Data for this study were collected between January and May 2017 from 25 villages located in the north-western mainland region of Bangladesh, 13 from two displacement-prone districts and 12 from districts without a history of displacement. The displacement-prone villages, 6 from Kazipur sub-district in Sirajganj district and 7 from Goalanda in Rajbari district, are on landmasses in the basins of the Padma and Jamuna rivers. The selected villages are highly vulnerable to a massive loss of land to the rivers and highly prone to displacement due to sudden and forceful flooding and riverbank erosion (Haque and Jahan, 2015). The 'non-displaced' villages, 6 from Mohanpur sub-district in Rajshahi district, and 6 from Manda, in Nagaon district, are located in the same region of Bangladesh. Whilst all four districts have experienced seasonal flooding, only the former two have been recognized by the Bangladeshi government as displacement-prone districts, considering the intensity of flooding, amount of precipitation and riverbank erosion, and the extent of displacement (MoDMR, 2014). Being located in the same region, the populations of all four districts are relatively similar in terms of sociocultural aspects.

2.3. Data sources and sampling method

A cross-sectional survey was conducted to collect information about children's illness and parental healthcare-seeking behaviors relating to child illness (Sedgwick, 2014). 1200 randomly selected households, 600 from the displacement-susceptible districts and 600 from the districts without a history of displacement, were targeted for interview. Using the highest prevalence rate of maternal healthcare indicators and the formula for random sampling ($n = Z^2P(1\text{-}P)/d^2$, where n = sample size; Z = 1.96 (95% CI); P = 0.36 prevalence of skilled birth attendants at birth; and d = 0.05, precision) design effects of 1.5, and a 10% nonresponse rate, a sample size of 587 for each group was estimated to be sufficient for the purposes of statistical analysis (Naing et al., 2006; NIPORT et al., 2016). This was rounded to 600 for convenience and to facilitate an equal distribution between the four districts. The obtained power (84.6%, which is sufficient) for target sample size was estimated using the known nationwide (0.36 in 2014) and targeted (0.42 in 2016 estimated using annualized progress between the 2011 and 2014 BDHS reports) prevalence of use of skilled birth attendants during delivery in rural Bangladesh (Chow et al., 2008; NIPORT et al., 2013; NIPORT et al., 2015). However, on analyzing our data, we found a larger than anticipated negative effect of displacement on the use of a skilled birth attendant during delivery (Cohen, 1977).

Considering the nature of the research question and the spatial distribution of the study populations, a combination of purposive and random sampling was used to select the study areas (Kemper et al., 2003). Four districts (two displacement-prone and two non-displacement-prone) were selected randomly. Purposive sampling was used to identify sub-districts and unions of the classified displacement-prone districts where large-scale displacement caused by the loss of homestead land to rivers had occurred, based on information obtained from local government office, NGOs and locally elected personnel (Haque and Hossain, 1988; MoDMR, 2014). Area-level sampling was used due to a lack of available individual-level records about displacement history. Within each area the sample was distributed proportionately between the villages on the basis of the total eligible households in each village. For each village, households were selected for interview using systematic random sampling based on computer-generated starting point and then adding sampling fraction for the subsequent numbers to extend the samples among all eligible cases. From each selected household, either the father or the mother was questioned about children aged below 15 years' old who had an illness in the last four weeks prior to the interview.

2.4. Data and variables

Information on households' demographic and socioeconomic attributes, self-reported displacement experience, incidence of child illness in the last four weeks prior to the interview date, types of diseases, perceptions of and responses to the last incidence of illness, sources of healthcare for that illness, and the local availability and accessibility of healthcare services were collected from parents using a structured survey questionnaire. Additionally, the parents of the children who received care were asked a question to identify the importance of a range of reasons for the selection of healthcare provider for their child's treatment.

The data of this study were collected using face-to-face interviews. Trained university graduates conducted the interviews, which typically lasted for 45–60 min. The survey questionnaire was translated into the local language, Bengali. Ethics approval was obtained from Macquarie University Ethics Committee and Bangladesh Medical Research Council. The latter process included checking of the accuracy of the translation. The potential benefits to the population envisaged in the ethics applications were provision of evidence to guide climate adaptation strategy and healthcare delivery policies, especially for displacement-prone districts in Bangladesh, and policy recommendations for local government officials and NGO workers to reduce the disparity in access to and utilization of quality healthcare services.

2.4.1. Outcome variables

Households were classified into two categories based on participants' self-reported responses: the 'displaced' (those who reported having been forced to change their place of usual residence permanently at least once in the last 10 years as a result of any kind of extreme weather or natural disaster-related event) and the 'non-displaced' (those who had never experienced displacement as a result of such events). The specific reference to 'usual residence' in the question ("Have you ever experienced displacement from your usual residence due to any kind of extreme weather event or natural disaster?") used to establish displacement status indicates the move was made with permanent intent, and excludes temporary returns to home following floods and riverbank erosion. Data from the survey show the displaced intend to stay in their current place of residence and they either do not have any (current) option to return to their previous residence or do not wish to do so. On average the duration of residence of the displaced in the current location was 4.4 years.

All 600 households in displacement-prone areas reported having been displaced, a pattern which reflects the purposive selection of areas

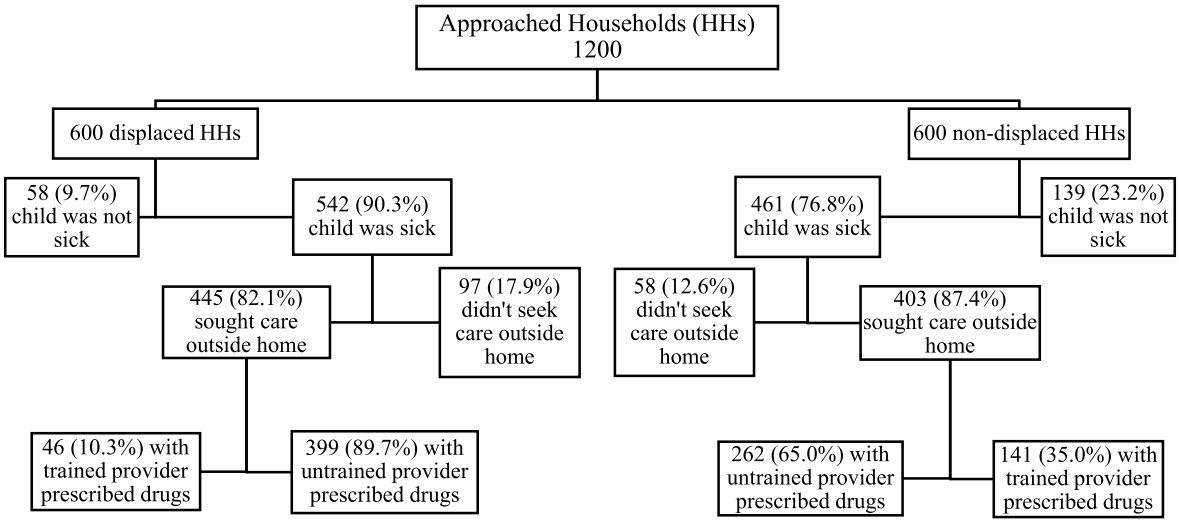

Fig. 2. Distribution of sampled households by displacement status and parental responses to child's illness.

(Fig. 2); a recent government report shows that 99% of the inhabitants of the mainland floodplain districts have experienced displacement (MoDMR, 2014). Returns to the pre-disaster village location can be rendered impossible by the effects of floods and changes to river channels. The survey data show roughly three-quarters of the most recent displacements involved a change of village. Furthermore, none of the 600 households in non-displacement-prone areas reported having been displaced.

The first outcome variable is a binary variable which classifies parental responses to the last illness of one of their children into those who either did not seek care for their child's illness or treated it with curative measures at home (cases) and those who sought care from outside the home with medicines for their children (controls). An odds ratio above one indicates a higher probability (than the reference category) the parents either did not seek healthcare or provided curative measures at home (Field, 2009).

For the second outcome variable, children who received treatment were classified into two groups based on the type of provider used for treatment of the last illness (excluding home-curative measures), those who were treated with trained provider-prescribed allopathic medicines (cases), and those who were treated with untrained provider-prescribed allopathic/traditional medicines (including self-medication) (controls) (Fig. 2). The 'trained providers' consist of medical doctors, nurses, midwives and community health workers while the 'untrained providers' consist of pharmacists, village doctors and traditional healers. Thus, an odds ratio above one indicates a higher probability (than the reference category) the care sought was from a trained care provider.

2.4.2. Predictor variables

The predictor variables were classified into predisposing factors (parental literacy status, age and sex of the child); enabling factors (household's monthly income and care seeking decision maker); health system factors (availability of care providers by type, and cost of reaching a healthcare center); perceived need-related factors (type and severity of illness) and environmental (displacement status) factors. The classifications of predictor variables used are shown in Tables 2 and 3.

In addition, the reasons given by parents for their selection of healthcare provider for treatment of the children were examined. Parents were asked to select one or more reasons, from a range of options, which were relevant to their selection of healthcare provider for the last illness of one of their children. The twenty-six reasons given were grouped into fourteen categories based on substantive coherence.

2.5. Statistical analysis

Table 1 presents the variation in parents' healthcare-seeking behaviors relating to the illness of their children and the various predictor variables by displacement status, together with results from chi-squares tests of association. Multiple logistic regression was then used to identify the effect of each predictor on the decision to seek healthcare (Table 2) and the effect on the type of healthcare provider selected (Table 3). The results are presented using the odds ratios (ORs) with 95% confidence intervals (CIs), level of significance and model chi-squares. The values of variance inflation factor (VIF) and tolerance statistics indicated no unacceptable collinearity for the models (Field, 2009).

3. Results

Of the 1200 sampled households, 83.6% reported one or more of their children had been sick in the four weeks prior to the interview. The percentage reporting an illness is significantly higher among the displaced (90.3%) than among the non-displaced (76.8%). Where a child had been ill, in 84.5% of cases, the parents sought healthcare outside the home for the most recent illness, and in the remaining 15.5% of cases parents either had not sought any care or else had used curative measures at home in response to the child's illness (Fig. 2). The percentage of the displaced parents who sought care outside the home (82.1%) is significantly lower than the percentage of the non-displaced parents (87.4%) who did so (Table 1). Moreover, among those seeking healthcare, the percentage of the displaced parents who treated their child's illness using an untrained provider (89.7%) is significantly higher than the percentage of the non-displaced parents (65.0%) who did so (Table 1).

The differences between the displaced and the non-displaced in the availability of medical doctors and trained care providers are stark and concerning. Only 21% of the displaced respondents reported having a medical doctor available within a 5 km radius of their residence, compared to 89% of the non-displaced (Table 1). Moreover, only 67% of the displaced respondents reported having a trained allopathic provider available within 1 km of their household, compared to 86% of the non-displaced households. The percentage of the displaced who reported the cost to reach to the nearest public/private healthcare facilities had increased over the last ten years is significantly higher than that of the non-displaced. Household's socioeconomic status and access to healthcare services are also associated with displacement status. The monthly income and literacy status of the displaced parents are significantly lower than those of the non-displaced. The widest difference is between the percentages with incomes over 15,000 taka. Only 56% of the displaced parent respondents are able to read or write, compared to 89% of the non-displaced parent respondents.

Deciding not to seek care (from outside the home) during a child's illness is significantly associated with the displacement status of parents, availability of untrained and trained care providers within a 1 km radius of the household, monthly household income, perceived severity of illness, sex and age of the child and the parents' involvement in decision-making for healthcare (Table 2). The proportion of cases in which parents did not seek healthcare during the child's illness is significantly higher among the displaced than among the non-displaced. The proportion not seeking healthcare for children is also significantly lower when an untrained provider or a trained care provider is available within 1 km of the household. Not seeking care for children is significantly less common among parents in higher income households than among parents in lower income households. The percentage of children with a severe illness who did not receive care is significantly lower than that for children with a mild illness. The proportion of cases in which care was not sought is significantly higher for female children than for male children, and significantly higher among children aged over two than among those aged under two. The likelihood of not seeking healthcare for children is significantly lower when the father and the mother made the healthcare-seeking decision jointly or when other family members made the decision than when the father or the mother made the decision alone.

The multivariate analysis in Table 2 shows the odds of parents either not seeking healthcare or providing care with curative measures at home during their child's illness are significantly affected by parents' displacement status and by a range of other predisposing, enabling and health-related factors linked with displacement. After controlling for the other predictor variables, displaced parents have an 83% higher probability (OR 1.83, 95% CIs 1.08–3.12) of seeking care for their child's illness than the non-displaced parents.

The availability and accessibility of healthcare providers also affects whether care is sought outside the home for child's treatment. Both having an untrained allopathic provider (OR 0.45, 95% CIs 0.257–0.801) and having a trained allopathic provider (OR 0.58, 95% CIs 0.36–0.94) available within a 1 km radius are associated with a significantly reduced likelihood of not seeking care. However, the effect of medical doctors' availability within a 5 km radius and the effect of whether the transport cost to reach a healthcare center had increased compared to 10 years ago are not significant. Children in higher income households, particularly those with a monthly income of 8001–10,000

Table 1
Parents' healthcare behaviors during child's illness by and displacement status and associated healthcare availability, socioeconomic, illness-related, demographic, and healthcare decision-making factors.

Variables	% of children who had illness (N = 1003)			% distribution of children who sought care (N = 848)		
	Displaced (n = 542)	Non-displaced (n = 461)	*Sig.*	Displaced (n = 445)	Non-displaced (n = 403)	*Sig.*
Parents' healthcare seeking behavior for children						
Received no care/curative care at home	17.9	12.6	**	–	–	
Received care from outside the home	82.1	87.4		–	–	
Type of care used during last illness						
Untrained provider (including self-care)	-	-		89.7	65.0	***
Trained care provider	-	-		10.3	35.0	
Untrained allopathic provider available within 1 km						
No	12.0	8.7	*	8.1	8.4	*ns*
Yes	88.0	91.3		91.9	91.6	
Trained allopathic provider available within 1 km						
No	33.4	14.5	***	29.2	13.9	***
Yes	66.6	85.5		70.8	86.1	
Medical doctor available within 5 km						
No	79.5	11.1	***	80.2	89.1	***
Yes	20.5	88.9		19.8	10.9	
Cost to reach health center compared to 10 years back						
Decreased	39.3	49.5	***	40.9	49.4	***
Same	10.5	20.4		11.5	19.6	
Increased	50.2	30.2		47.6	31.0	
Household's monthly income (taka)[1]						
≤ 8000	46.7	41.2	***	44.9	39.7	***
8001–10,000	34.7	26.7		36.6	28.0	
10,001–15,000	14.4	15.4		14.4	14.4	
≥ 15,001	4.2	16.7		4.0	17.9	
Parental literacy status						
Unable to read or write	44.5	14.5	***	43.6	14.6	***
Able to read or write	55.5	85.5		56.4	85.4	
Perceived illness severity						
Mild	29.9	29.9	*ns*	30.3	28.0	*ns*
Moderate	38.4	37.1		36.4	36.5	
High/severe	31.7	33.0		33.3	35.5	
Types of illness						
Fever and coughing	81.9	79.6	*ns*	83.1	78.9	*
Gastrointestinal diseases	9.2	8.5		8.8	8.2	
Others (e.g., eye/nose/throat/jaundice/typhoid)	8.9	11.9		8.1	12.9	
Sex of child						
Male	51.1	56.0	*ns*	53.7	56.8	*ns*
Female	48.9	44.0		46.3	43.2	
Age of child (years)						
≤ 1	23.4	23.4	*ns*	24.0	25.3	*ns*
2-3	27.9	28.9		27.4	29.5	
4-14	48.7	47.7		48.5	45.2	
Healthcare decision maker						
Father or mother alone	20.5	44.0	***	16.0	40.7	***
Father and mother jointly	65.7	45.8		69.2	48.6	
Other family members	13.8	10.2		14.8	10.7	

Significance level *P < 0.10; **P < 0.05; ***P < 0.001; ns = not significant, 1 = Taka 80.7 for 1 US$ as of June 2017.

taka (OR 0.51, 95% CIs 0.32–0.81) or above 15,000 taka (OR 0.50, 95% CIs 0.24–1.05) are significantly less likely not to receive any care than those in the lowest income (≤8000 taka) group. However, the effect of parental literacy is small and not significant.

Not seeking healthcare is significantly affected with the parents' perception of the severity of the illness and by the age and sex of the child. When a child's illness is perceived by their parents as severe (OR 0.44, 95% CIs 0.26–0.75) the likelihood of the child being untreated is significantly lower than when a child's illness is perceived to be mild. Children aged 4 or above years (OR 1.88, 95% CIs 1.12–3.13) have significantly higher probabilities of not receiving care for the illness than children ≤1year old. Female children are significantly more likely than male children not to receive healthcare (OR 1.50, 95% CIs 1.04–2.19). However, the effect of illness type on the likelihood of parents seeking healthcare outside the home is insignificant. Children are significantly less likely to be untreated when the father and the mother made the healthcare-seeking decision jointly (OR 0.35, 95% CIs 0.23–0.53) or when other members of the family made the decision (OR 0.40, 95% CIs 0.21–0.80) than when the father or mother made the decision alone.

When healthcare is sought outside the home for the child's illness, 77.9% of the children are treated by untrained (pharmacist, 'village doctor, homeopath, traditional healer) provider-prescribed allopathic/traditional medicines (including self-medicated) and the remaining 22.1% by trained (medical doctors/nurses/midwives/community health workers) provider-prescribed allopathic medicines. The percentage of the displaced (10.3%) treated with trained provider-prescribed allopathic medicines is less than one-third of the percentage of the non-displaced (35.0%) (Table 3).

Table 3 shows that the use of a trained care provider for a child's treatment is more than three times more common when a medical doctor is available within a 5 km radius (33.8%) than otherwise (9.0%). Surprisingly, neither the local availability of an untrained care provider nor the availability of a trained care provider within 1 km is significantly associated with using a trained care provider. Parents who reported an increased (13.6%) cost of reaching a healthcare center are less likely to use a trained care provider for their child's illness than those who reported a decreased (26.8%) or a similar (30.0%) cost. The

Table 2
Factors associated with parents' healthcare-seeking decision (no care/curative care at home versus sought care) for their child's illness.

Predictor variables	% not seeking care for illness	Sig.	Multivariate odds ratios (CIs) of not seeking care	Sig.
Parents had experienced displacement in last 10 years				
No	12.6	**	1.00	.**
Yes	17.9		1.83 (1.08–3.12)	
Untrained allopathic provider available within 1 km				
No	33.3	***	1.00	
Yes	13.4		0.45 (0.26–0.80)	**
Trained allopathic provider available within 1 km				
No	25.0	***	1.00	
Yes	12.3		0.58 (0.36–0.94)	**
Medical doctors available within 5 km				
No	16.8	*ns*	1.00	
Yes	14.2		1.14 (0.69–1.90)	*ns*
Cost of reaching health center compared to 10 years ago				
Decreased	13.6	*ns*	1.00	
Same	13.9		0.95 (0.53–1.69)	*ns*
Increased	18.0		1.03 (0.67–1.59)	*ns*
Household's monthly income (taka)				
≤ 8000	18.7	**	1.00	
8001–10,000	11.3		0.51 (0.32–0.81)	***
10,001–15,000	18.1		0.99 (0.59–1.68)	*ns*
≥ 15,001	10.0		0.50 (0.24–1.05)	*
Parental literacy status				
Unable to read or write	17.9	*ns*	1.00	
Able to read or write	14.4		1.06 (0.70–1.62)	*ns*
Perceived illness severity				
Mild	17.3	***	1.00	
Moderate	18.5		0.87 (0.56–1.34)	*ns*
High/severe	10.2		0.44 (0.26–0.75)	***
Types of illness				
Fever and coughing	15.2	*ns*	1.00	
Gastrointestinal diseases	19.1		1.50 (0.80–2.81)	*ns*
Others (e.g., eye/nose/throat/jaundice/typhoid)	14.6		1.13 (0.59–2.18)	*ns*
Sex of child				
Male	12.5	**	1.00	
Female	18.8		1.50 (1.04–2.19)	**
Age of child (years)				
≤ 1	11.1	*	1.00	
2-3	15.1		1.42 (0.81–2.48)	*ns*
4-14	17.8		1.88 (1.12–3.13)	**
Healthcare decision maker				
Father or mother alone	25.2	***	1.00	
Father and mother jointly	11.1		0.35 (0.23–0.53)	***
Other family members	10.7		0.40 (0.21–0.80)	**
Model χ^2(df)with significance level			102.33 (19), P < 0.000	
Overall predicted percentage			84.9	
-2Log likelihood and (Nagelkerke score)			761.25 (0.168)	

Significance levels *P < 0.10; ** < 0.05; *** < 0.00; ns = not significant.

household's socioeconomic status is also positively associated with the use of a trained care provider for the child's care. In households with a monthly income ≥15001 taka (41.1%), trained care providers are used significantly more often than in those with a monthly income of ≤8000 taka. Parents who can read or write (24.9%) use trained care providers significantly more than those who are unable to read or write (15.4%). The percentage of children who are treated using a trained care provider increases with the severity of the illness. The percentage of parents who use a trained care provider to treat their child's illness is higher for 'other types of disease' (e.g., eyes/nose/throat, jaundice and typhoid) (38.6%) than for fever/coughing (20.3%) or gastrointestinal diseases (18.1%). However, the differences in the percentages using trained providers for care by the sex and the age of the child and by the decision maker for seeking healthcare are not statistically significant.

Table 3
Factors associated with using trained versus untrained healthcare provider during a child's illness.

Predictor variables	% of children treated by trained provider for illness	Sig.	Multivariate odds ratios (CIs) of using trained provider vs untrained provider	Sig.
Parents had experienced displacement in last 10 years				
No	35.0	***	1.00	
Yes	10.3		0.44 (0.26–0.73)	***
Untrained allopathic provider available				
No	25.7	*ns*	1.00	
Yes	21.7		0.91 (0.45–1.85)	*ns*
Trained allopathic provider available within 1 km				
No	19.4	*ns*	1.00	
Yes	22.8		0.81 (0.47–1.38)	*ns*
Medical doctors available within 5 km				
No/don't know	9.0	***	1.00	
Yes	33.8		2.83 (1.67–4.79)	***
Cost to reach health center compared to 10 years ago				
Decreased	26.8	***	1.00	
Same	30.0		0.93 (0.57–1.52)	*ns*
Increased	13.6		0.52 (0.33–0.82)	**
Household's monthly income (taka)				
≤ 8000	18.9	***	1.00	
8001–10,000	19.2		1.24 (0.79–1.93)	*ns*
10,001–15,000	23.8		1.54 (0.88–2.69)	*ns*
≥ 15,001	41.1		2.41 (1.36–4.29)	***
Parental literacy status				
Unable to read or write	15.4	***	1.00	
Able to read or write	24.9		1.07 (0.66–1.72)	*ns*
Perceived illness severity				
Mild	11.3	***	1.00	
Moderate	20.7		2.20 (1.31–3.69)	***
High/Severe	32.6		3.82 (2.24–6.51)	***
Types of illness				
Fever and coughing	20.3	***	1.00	
Gastrointestinal diseases	18.1		0.78 (0.39–1.56)	*ns*
Others (e.g., eye/nose/throat/jaundice/typhoid)	38.6		1.81 (1.04–3.14)	**
Sex of child				
Male	24.1	*ns*	1.00	
Female	19.5		0.80 (0.55–1.17)	*ns*
Age of child (years)				
≤ 1	24.9	*ns*	1.00	
2-3	23.7		0.89 (0.55–1.47)	*ns*
4-14	19.6		0.84 (0.53–1.33)	*ns*
Healthcare decision maker				
Father or mother alone	24.7	*ns*	1.00	
Father and mother jointly	21.6		1.63 (1.07–2.50)	**
Other family members	18.3		0.87 (0.46–1.66)	*ns*
Model χ^2(df)			163.60 (19), P < 0.000	
Overall predicted percentage			79.4	
-2Log likelihood and (Nagelkerke score)			731.15 (0.269)	

Significance levels *P < 0.10; ** < 0.05; *** < 0.00; ns = not significant.

The results of the multivariate analysis of whether a trained provider is used are shown in the right-hand column of Table 3. Even after controlling for the other variables in the model, the displaced parents are significantly less likely (OR 0.44, 95% CIs 0.26–0.73) to use trained care providers for their child's treatment than the non-displaced parents. The availability of a medical doctor within 5 km has a significant positive effect on the likelihood of using a trained care provider (OR 2.83, 95% CIs 1.67–4.79). Parents who experienced an increased cost of reaching a healthcare center are significantly less likely to use a trained care provider (OR 0.52, 95% CIs 0.33–0.82) than those who

experienced a reduced cost. Children in households with monthly income ≥15,001 taka are the most likely to be treated with trained provider-prescribed medicines, and are significantly more likely to receive such treatment (OR 2.41, 95% CIs 1.36–4.29) than children in households with monthly income ≤8000.0 taka. However, parental literacy effects on type of provider selected are not significant, after controlling for household income and the other variables.

Use of a trained care provider for a child's treatment is significantly related to the parental perception of the severity and the type of the illness. Parents are significantly more likely to seek care from a trained care provider in cases of severe illness (OR 3.94, 95% CIs 2.27–6.84) than in the cases of mild illness. Parents are also significantly more likely to use care provided by a trained provider when the child is suffering from an 'other' type of disease (OR 1.81, 95% CIs 1.04–3.14), and significantly less likely to do so for a gastrointestinal disease (OR 0.78, 95% CIs 0.39–1.56) than when it has a fever or a cough. However, the effects of the sex and age of the child on type of provider selected are not significant. The probability of using a trained healthcare provider is significantly greater when the child's father and mother select the provider jointly (OR 1.63, 95% CIs 1.07–2.50) than when one parent makes the decision alone.

Fig. 3A and B summarize the 3239 reasons for the choice of healthcare provider given by the 848 parents who sought healthcare outside the home by whether the provider was trained or untrained and whether the parent was displaced or not displaced. Across the total sample 'familiarity with the provider' is the single most important consideration (61% of parents mentioned this), followed by the treatment cost being affordable (53%), the provider being within walking distance (37%), the provider's availability and accessibility (37%), satisfaction with the provider's expertise (34%), the availability of a flexible payment system (33%), there being no cost for consultation except for medicine (33%), the illness being common (20%) and there being no opportunity costs (e.g., transport and food) (20%). However, wide variations in the reasons given by the provider type and between the displaced and the non-displaced are evident.

For untrained provider selection, reasons related to affordability and accessibility of healthcare are more commonly given by the displaced parents than by the non-displaced parents (Fig. 3A). The greater importance of affordability among the displaced than among the non-displaced is evident from the higher percentages of the former citing 'treatment cost being affordable', 'availability of a flexible payment system', and 'no cost for the consultation except for the medicine', and may be linked to their lower incomes (Table 1). The greater importance of accessibility for untrained provider selection among the displaced is

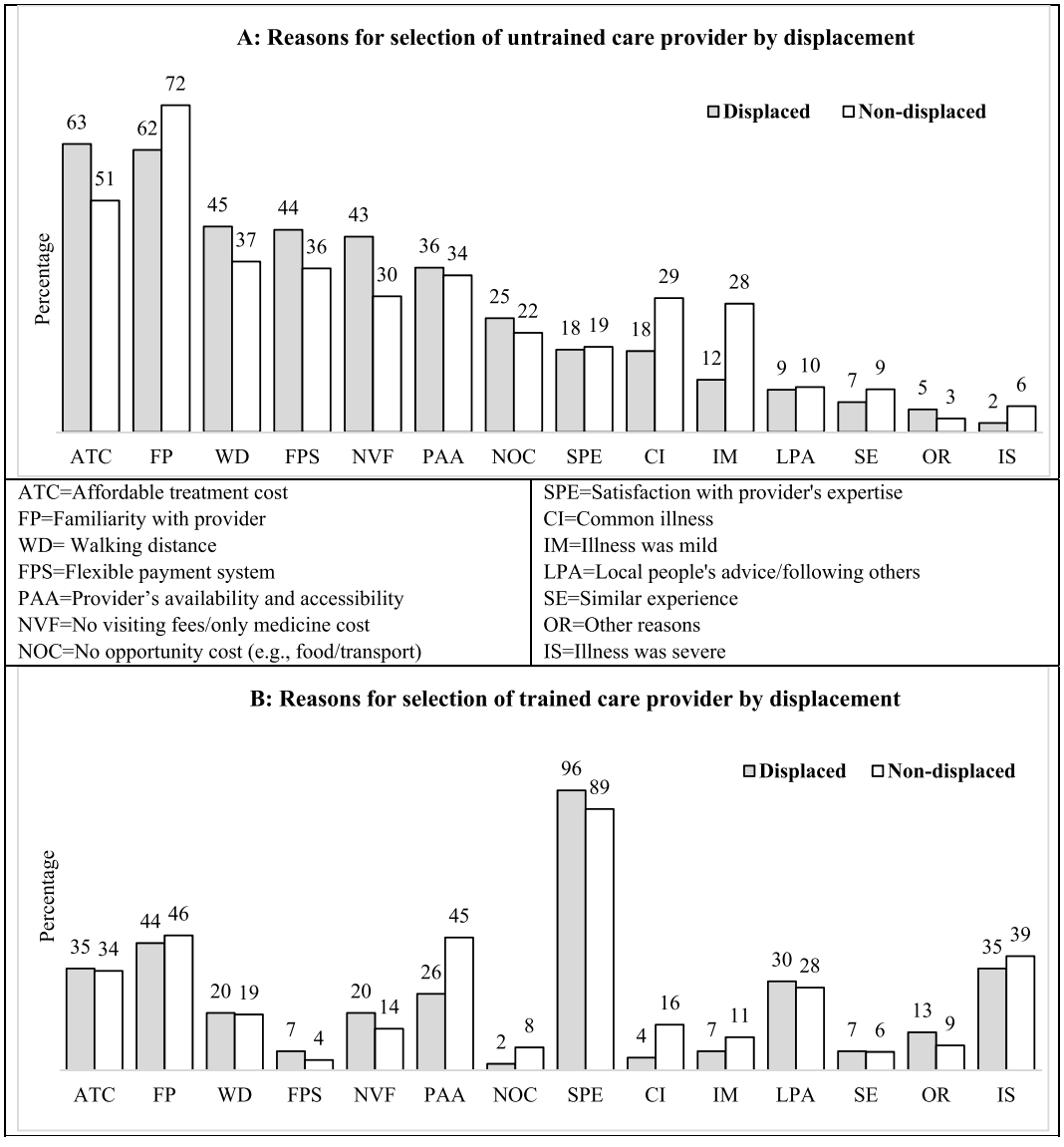

Fig. 3. Percentage giving reason for selecting healthcare provider by provider type and displacement status.

shown by the higher percentage citing 'walking distance to reach care provider' and the slightly higher percentage citing 'availability and accessibility of the provider', and is possibly linked with the lack of quality care in the displacement-prone areas and the opportunity costs incurred in accessing such care (Table 1). 'Familiarity with the provider' is cited less frequently by the displaced than by the non-displaced, which may be a legacy of displacements of the displaced and their previous local providers, and may to some extent explain the displaced parents' greater dependency either on home care or self-medicated care. The less frequent references to aspects of the severity and nature of the illness of the children among the displaced may also reflect their more limited options for trained or quality care.

Fig. 3B shows that among those who selected a trained provider, 'satisfaction with provider's expertise' is the single most widely-given reason both among the displaced parents and among the non-displaced parents (89% and 96% respectively) followed by 'familiarity with the provider' (44% and 46% respectively). However, in trained provider selection, 'provider availability and accessibility' is more important among the non-displaced than the displaced, which may reflect the unavailability of trained providers and medical doctors in the displacement-prone areas (Table 1). That 'No opportunity cost' of accessing a trained provider is cited by a higher percentage of the non-displaced than the displaced, may reflect the greater local availability of such providers to the non-displaced, and also be a part of the explanation of the more extensive use of such providers among the non-displaced. The higher percentage citing 'no cost for the consultation except for the medicine' among the displaced than among the non-displaced may reflect their economic impoverishment (Table 1). That illness features are less commonly-mentioned among the displaced than among the non-displaced may also be connected with lack of availability, accessibility and affordability of medical doctors in the displacement-prone areas (Table 1).

4. Discussion

This paper demonstrates the considerably reduced healthcare options of parents who have experienced displacement linked to floods and riverbank erosion, and that this has long-lasting effects on their healthcare-seeking behaviors for their children's illnesses. Even when compared to parents who live in the same region of rural Bangladesh and who are similar in socio-cultural terms but who have not experienced such a displacement the differences are considerable. Moreover, significant differences in parental healthcare-seeking behavior for children's illnesses between those who have experienced displacement and those who have not persist even after controlling for a wide range of healthcare availability, socioeconomic, demographic, and illness-related variables.

This paper shows, for the first time to the authors' knowledge, that, despite having higher rates of children's illness than the non-displaced displaced parents are less likely to seek care outside the home for their child's treatment than the non-displaced. Moreover, when care is sought, the children of the displaced are more likely than the children of the non-displaced to be treated by untrained providers (as opposed to by trained providers). These patterns should be of major concern, because of the limited healthcare knowledge of the untrained providers and the lack of standard care received by the children of the climate-related displaced they show is likely detrimental to child recovery from illness, parental health literacy, and future health outcomes (Ahmed and Hossain, 2007; Ahmed et al., 2009; Mahmood et al., 2010).

Consistent with previous studies for Bangladesh, this study finds that parents with lower incomes are less likely than those with higher incomes to seek care outside the home for their children's illness and less likely to use a trained care provider for their child's treatment (Amin et al., 2010; Das et al., 2013; Huq and Tasnim, 2008). This study also shows the displaced have significantly lower incomes than the non-displaced (Hutton and Haque, 2004). However, whilst some of the effects of displacement on healthcare-seeking behavior may be due to an effect of displacement on household income, the regression analyses show the effects of displacement extends far beyond its effect of income. As well as lower incomes, displaced parents face a range of other socioeconomic disadvantages, including some which are a direct result of their displacement experience, which constrain their responses to the illness of their children. The displaced have less access to land, electricity, and media, fewer sanitary toilets, a higher incidence of illness, and they face higher costs of healthcare than their non-displaced counterparts (Abrar and Azad, 2007; Hutton and Haque, 2004; MoEF, 2009). Substantial costs can result from displacement, leading to debt and a burden of interest and debt repayment. Moreover, experience of being displaced multiple times is common, and may compound the disadvantage of those affected (Arsenault et al., 2015; Haque and Hossain, 1988; Hutton and Haque, 2004). Such adverse effects of displacement may contribute to the explanation of the greater emphasis the displaced place on cost-related reasons for selecting care providers, and the greater incidence of illness, lower rates of seeking healthcare outside the home, and greater use of untrained provider-prescribed treatment among the displaced (Fig. 3A and B).

This study demonstrates for the first time for the mainland climate-displacement-prone areas the greater lack of local availability of healthcare services among the displaced, compared to the non-displaced. This study shows that in the mainland riverine areas, the use of healthcare outside the home by parents for children is reduced substantially where a lack of locally-available care providers is evident, and parents' use of trained providers for their child's care is reduced where medical doctors are not locally available or when increases in the cost of reaching health facilities have been experienced. The reduced access to healthcare of the displaced may reflect that households in displacement-prone areas (and local healthcare providers) are often forced to move to more geographically remote locations which are away from the local market and local healthcare and other facilities. Following relocation, the displaced may also lose benefits which can result from familiarity with a local healthcare provider, such as options to visit without prior appointment, flexible payment options and home visits from the provider, and this may adversely affect their healthcare-seeking behavior (Fig. 3A and B).

The lack of access to health facilities of the displaced is likely to be more than a matter of the travel distances considered in this paper's analyses. The displaced face greater disadvantages in terms of the time and costs of accessing healthcare providers, which stem from the local availability of modes of transport, the implications of which are likely to be accentuated by their socioeconomic disadvantages. This study shows the importance of such considerations for selection of provider for their child's treatment among the displaced (Fig. 3A and B). Whereas people in the non-displacement-prone areas generally may choose to travel along roads using motor-vehicles, those in the flood-affected areas are often dependent on boats or a combination of boat and long walking distance for travel, including to healthcare providers (Alam et al., 2017; Parvin et al., 2016; Sarker et al., 2003). Thus, in order to reach trained providers and medical doctors the displaced face longer travel times with their ill children, and incur higher costs for travel, food on the journey and a greater loss of income-earning time. Such indirect costs may deter the displaced from using trained care providers for their children's treatment, and explain some of the 'displacement status' effects shown in the multivariate analyses. The rigid payment system for medical doctor services (care receivers have to pay all costs immediately) also constrains the use of these services by the displaced, most of whom earn their income on a daily-basis from laboring work and lack substantial savings.

This study also finds that children are not only more likely to be treated outside the home but also more likely to be treated using trained care providers when the father and mother make the healthcare-related decisions jointly than when decisions are made by the father alone or the mother alone. In rural areas of developing countries

such as Bangladesh, mothers often have a better knowledge and understanding of child health issues than fathers, and yet decision making, especially for matters with financial consequences, tends to be male dominated (Pardosi et al., 2017). Discussion between the father and mother about their child's illness may be associated with greater parental concern about their child's health, and may also heighten their perception and understanding of the threat of illness, and hence the likelihood of their using healthcare, especially trained-provider care, for their child's treatment.

The results for severity and type of illness are broadly similar to those reported by other studies: use of traditional and untrained-provider-prescribed care is more common for mild and common child illnesses (Das et al., 2013; Huq and Tasnim, 2008). The patterns of male and younger children being more likely to receive care during illness than females and older children are similar to those found in other studies on Bangladesh (Alam et al., 2009; Das et al., 2013; Mahmood et al., 2009).

Certain limitations to the data collected should be noted. Firstly, the data could not capture the effects of seasonal variation in illness and the responses to illness, because, in flood-affected regions, fieldwork can only practically be conducted during winter, in view of the considerable difficulties which flooding, riverbank erosion, and transport barriers create for reaching potential respondents during the wetter summer season. During the wetter season potential participants may be less willing to be interviewed in view of displacement threats and related needs, such as to protect or relocate their household's possessions. It should be noted the collection of longitudinal data for poor and often illiterate populations which are dispersed regularly by flooding and riverbank erosion and for whom post-displacement official records are often unavailable would be problematic. Our study collected cross-sectional data from a large sample of households and endeavored to collect data on change over time retrospectively. The effect of recall bias on our outcome measures is likely to be minor, because only the most recent incidence of illness within the four weeks prior to the interview date was analyzed (Alam et al., 2009; Edgeworth and Collins, 2006). Moreover, all responses were collected from the relatives (i.e. the father or the mother) who are the most likely to act as caregivers during the child's illness. However, some misclassification might occur if parents report socially desirable responses (use of trained care providers) relating to managing children's illness. Recall bias is potentially a greater issue to the responses about changes in transport costs over time. However, in order to minimize this, the graduate enumerators were trained to cross-check the respondents' answers by probing the mode of transport, approximate distance and time between the two periods, and to discuss such matters with local representatives and elderly people.

According to IPCC (2014, 2018), the observed warming of mean global surface temperature for the period 1880–2012 was 0.85 °C. IPCC projects global surface temperature will increase further over the period to 2100 under all its assessed emission scenarios and that extreme precipitation events will become more intense and frequent in many regions. Sea level and temperature are also projected to increase. The frequency and magnitude of erratic precipitation and severe floods have increased in Bangladesh over the last 25 years (Islam and Shamsuddoha, 2017; Khan, 2017). Further sea-level rise, increased precipitation and surface temperature could adversely affect the hydrology and water resources of the major river basins of Bangladesh and lead to more severe floods in both its coastal and its mainland regions (Karim and Mimura, 2008; Kundzewicz et al., 2014; Mirza, 2002). If realized, the projected future changes in climate could present multiple, severe affordability and accessibility-related challenges to health-seeking behavior in this region (Hassani-Mahmooei and Parris, 2012; Poncelet et al., 2010; Pender, 2008). Our study does not consider climate change per se. However, it does provide new and strong empirical evidence of adverse effects of displacement and health-seeking behavior, which may be seen as a link in one of the various theoretical pathways of effects connecting climate change, and health (Andersen, 1995; Schwerdtle et al., 2018).

5. Conclusion

This study shows the substantial and long-lasting adverse effects of parental displacement in mainland Bangladesh on their healthcare-seeking behaviors for their children's illnesses, and that the displaced experience multiple disadvantages which contribute to these patterns.

This study's findings have important implications for enhancing healthcare-seeking behavior for the large and growing number of children who are affected by climate-related displacement in Bangladesh and other countries facing similar challenges and for the targeting and effectiveness of Primary Healthcare provision. In view of the lack of local healthcare service availability in the riverine displacement-prone areas, as shown by this study, policy makers should consider the relocation of Community Clinics and NGO healthcare service outlets closer to the areas in which the displaced have resettled and increasing the supply of free medicines and other healthcare-related resources allocated to serving this disadvantaged and hard-to-reach subpopulation. Recognizing the socioeconomic disadvantages of the displaced and the transport difficulties and costs associated with accessing healthcare services, the number of trained providers and medical doctors posted at union healthcare centers in the classified disaster-prone districts should be increased. Moreover, reintroducing the provision of home-based primary healthcare service delivery by community health workers, if necessary call-based, in the displacement-prone areas may benefit population health and contribute to the achievement of the UN Sustainable Development child health-related targets (Cockcroft et al., 2007; UN, 2015). In view of the high levels of dependency on locally-available untrained providers, especially among the displaced, training of the untrained providers about Primary Healthcare service provision and referral should be incorporated into the existing healthcare management program as an interim measure, until such time as the shortage of the medical doctors can be rectified (Ahmed et al., 2011; Uddin and Mazur, 2015). Extending the coverage of the Bangladesh climate-adaptation safety net program for the displaced may help to alleviate poverty and thereby improve health (Costello et al., 2009). Furthermore, initiatives to generate alternative employment opportunities, such as cattle and dairy farming, handloom knitting, and fishing net and other manufacturing industries, in the riverine areas could be adopted to address the economic disadvantage of the displaced, and thereby increase their utilization of healthcare services.

Declaration of interest

None.

Ethics approval

The research project has been approved by the Macquarie University Human Research Ethics Committee (Ref: 5201600776) and the National Research Ethics Committee of Bangladesh (Ref: BMRC/NREC/2016–2019/1770).

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